C-A OPERATIONS PROCEDURE MANUAL

C-A TPL 05-02 TEMPORARY PROCEDURE: MONITORING BEAM DUMPED IN THE
LAMBERTSON MAGNETS DURING FY05 RHIC X/Y ARC SETUP

Text Pages 2 through 4

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Approved by:_____ _____
                Assoc. Chairman for ESHQ   Date

P. Ingrassia

C-A TPL 05-02   TEMPORARY PROCEDURE: MONITORING BEAM DUMPED IN THE
                  LAMBERTSON MAGNETS DURING FY05 RHIC X/Y ARC SETUP

1.   Purpose

       1.1   The purpose of this procedure is give instructions to Operators to monitor the number of ions
                dumped in the RHIC injection Lambertson magnets during the FY05 RHIC X/Y arc setup.

       1.2   Flux limits are set to allow ions to be dumped in the RHIC injection area while keeping production
                of tritium and Na^{22} well below the limits established by the SBMS Subject Area for known beam
                losses.

       1.3   The flux limit, at the AGS extraction energy of ~10 GeV/nucleon, is 8x10^11 Cu ions per ring
                (yellow/blue). This corresponds to 800 pulses per ring at 1x10^9 Cu ions per pulse.

2.   Responsibilities

       2.1   The MCR operators and Operations Coordinators are responsible for the execution of this
                procedure.
       2.2   The MCR Deputy Group Leader is responsible to ensure that alarm display filters are set such that
                Jeff alarms are displayed on the ADT.

3.   Prerequisites

       3.1   The AtR current transformer wxf1 is operational
       3.2   The GPM watchdog (Jeff) ATR_ASE.mon is running
       3.3   The JeffSTATS server must be operational.
       3.4   The target group for this procedure is the MCR Operators, Operations Coordinators, and the
                cognizant physicist responsible for the arc setup.
       3.5   The RHIC liaison physicist has defeated the beam such that the ions will be stopped in or around
                the injection Lambertson magnets.
       3.6   The training requirement for this procedure is read and sign.
       3.7   The minimum number of staff members that need to be trained in order for this procedure to be
                effective is three, one OC, one MCR Operator, and the cognizant physicist who is responsible for
                the X/Y arc setup.

4.   Precautions

       4.1   The ATR_ASE.mon watchdog can generate two alarms. One alarm is generated when 90% of the
                flux limit per arc is exceeded. The second alarm is generated when the "hourly" flux limit per arc
                is exceeded. The "hourly limit" is set at 12% of 8x10^11 ions. IF 1x10^9 ions are extracted per
                bunch THEN the hourly limit will be exceeded after 96 bunches are extracted.

5.   Procedure

       5.1   Calibrating wxf1

                5.1.1   wxf1 will be used by ATR_ASE.mon to count ions. To calibrate wxf1 BEFORE the X/Y
                          arc setup

                          5.1.1.1   Turn off/standby the switching magnet power supply and the X and Y arc power
                                    supplies.
                          5.1.1.2   Extract beam and optimize transmission to the W dump.
                          5.1.1.3   Calibrate wxf1 by verifying that the AGS CBM at extraction, uxf1, uxf3, wxf1
                                    are within ten percent of each other.

5.1.1.4 When wxf1 is "calibrated" THEN turn on the switching magnet power supply and the X/Y arc power supplies to setup the arcs.

5.1.1.5 IF the wxf1 transformer fails during the X/Y arc setup then the ATR_ASE cognizant operator (Kling) is authorized to modify the GPM ATR_ASE.mon to utilize uxf3 (or uxf1) in place of wxf1.

5.2 Setting up the arcs

5.2.1 Verify ATR_ASE.mon is running

5.2.1.1 Use VBAR to select the video and verify that the cycle number is updating.

5.2.1.2 Verify that the ADT filter is set to allow JEFF alarms.

5.2.2 Transport beam down the arcs.

5.2.2.1 The RHIC liaison physicist shall ensure that beam will be stopped in or around the RHIC injection Lambertson magnets.

5.2.2.2 IF a level III JEF.X_Arc_Hourly range error alarm or a level III JEF.Y_Arc_Hourly range error alarm is seen on the ADT, THEN consult the ATR_ASE.mon video and verify that the "% of Limit" for the X/Y Arc "Run Total" is small. IF the "% of Limit" is **not** small, THEN alert the OC and the cognizant physicist that the Run Total could be exceeded for an arc if the extracted beam intensity is not reduced.

5.2.2.3 IF a level IV JEF.X_Arc_Run_TOT range error alarm or a level IV JEF.Y_Arc_Run_TOT range error alarm is seen on the ADT, THEN 90% of the flux limit for the run has been exceeded. Alert the OC and the cognizant physicist that the Run Total could be exceeded for an arc and consideration must be given to reducing the beam intensity and terminating the setup exercise.

6. <u>Documentation</u>
   6.1 None

7. <u>References</u>:
   7.1 None

8. <u>Attachments</u>:
   8.1 Sample ATR_ASE.mon display

Attachment 8.1   Sample ATR_ASE.mon display

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┌─────────────────────────────────────────────────────────────────────────────┐
│                    ATR_ASE.mon  PPM User 1                        _ □ ✕       │
├─────────────────────────────────────────────────────────────────────────────┤
│  File   Setup   Logging   Diagnostics                                         │
├─────────────────────────────────────────────────────────────────────────────┤
│ ON                ATR ASE Page              U1     Nov 17 10:07:18  Cycle  526│
│           Started Nov 17 09:39                                                │
│                    C-A TPL  05-02                                             │
│ ============================================================                  │
│    SWM  Status: Stby, Fa        Current:    -0.0                              │
│    AGS  Extraction:      0.0                                                  │
│    U-Line   UXF3:           X                                                 │
│    W-Line   WXF1:           X                                                 │
│    X-Arc:               0.0                                                   │
│    Y-Arc:               0.0                                                   │
│    Cycle  Lenth(sec):   4.0                                                   │
│ ============================================================                  │
│                                                                              │
│          X/Y _BEAM_FLUX       FLUX_Limit      % of Limit     Pulse  Count    │
│                                                                              │
│ Hourly  Totals:                                                              │
│     X Arc:         0.0         1.6e+10          0.0             0.0           │
│     Y Arc:         0.0         1.6e+10          0.0             0.0           │
│ Run  Totals:                                                                 │
│     X Arc:         0.0         8.0e+11          0.0             0.0           │
│     Y Arc:         0.0         8.0e+11          0.0             0.0           │
│                                                                              │
│ **Run  Totals  only  valid  on VBAR  displays                                │
│                                                                              │
├─────────────────────────────────────────────────────────────────────────────┤
│                        Message Area                               Stop        │
└─────────────────────────────────────────────────────────────────────────────┘
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